Taxonomic Revision of the Polypodiaceous Genera of India—III. Pleopeltis

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Pleopeltis Humb. and Bonpl. ex Willd. is mainly a tropical American fern genus. Most of the species described in this genus from the Indian region by Beddome (1863–65?, 1892) have now been transferred to other polypodiaceous genera such as *Lepisorus* (J. Smith) Ching, *Microsorium* Link, *Phymatodes* Presl, *Colysis* Presl, and *Arthromeris* J. Smith.

Copeland (1947, p. 183) circumscribed *Pleopeltis* so as to include *Lepisorus*, which was recognized earlier as an independent genus by Ching (1933, 1940, p. 258), Christensen (1938), and Holttum (1946, 1954). Sledge (1960) and Panigrahi and Patnaik (1964, 1965), however, followed Copeland in uniting these two genera. Ching (1933) recognized and redefined *Lepisorus* to include the Asiatic species that had been placed in *Pleopeltis*, while maintaining the latter as a New World genus. We have followed Ching and Christensen in treating the two genera as distinct, but consider *Pleopeltis* to be present in the Old World also. The species of *Lepisorus* do not belong in *Pleopeltis*, although they are greatly similar in frond outline and sorus shape and position. Christensen (1938, p. 547) described the scales of *Lepisorus* as "often clathrate" and those of *Pleopeltis* as "non clathrate," but according to Copeland, this distinction is not tenable; the scales of both genera are distinctly clathrate. However, there is a definite difference in scale distribution on the under surface of the lamina. In *Lepisorus* only the midrib is scaly, whereas the under surface of *Pleopeltis* fronds is uniformly covered with peltate, orbicular-lanceolate, appressed, usually fimbriate scales. This difference is very constant in the Indian species.

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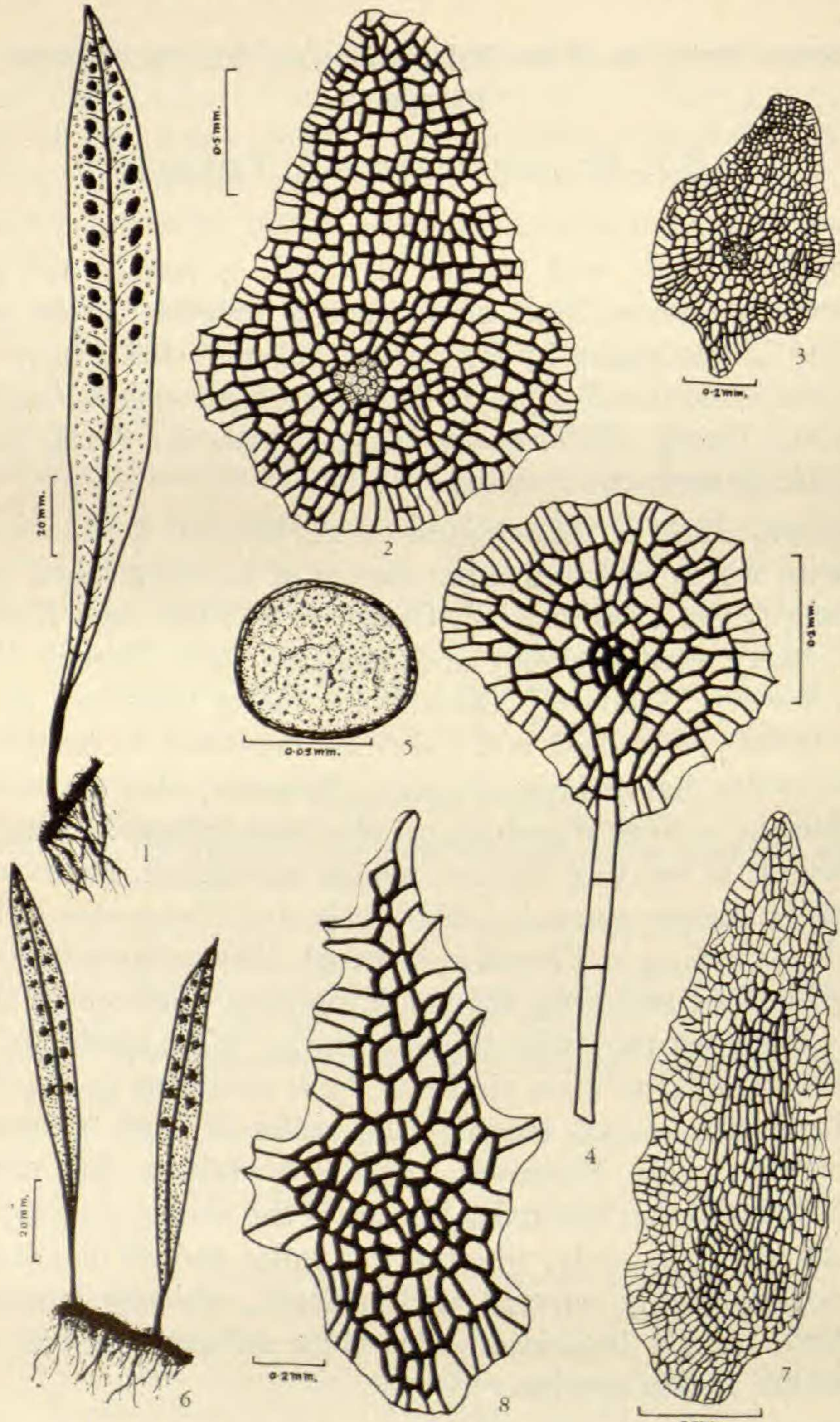


Figs. 1–5. Pleopeltis macrosphaera var. asterolepis. Fig. 1. Habit sketch. Fig. 2. Rhizome scale. Fig. 3. Frond scale. Fig. 4. Sporangial paraphysis. Fig. 5. Spore. Figs. 6–8. P. macrocarpa. Fig. 6. Habit sketch. Fig. 7. Rhizome scale. Fig. 8. Frond scale.

PLEOPELTIS Humb. & Bonpl. ex Willd. in L. Sp. Pl., ed. 4, **5**: 211. 1810.

Rhizome wide-creeping, paleate; fronds articulated to the rhizome, uniform or slightly dimorphic, simple or rarely pinnatifid, entire, coriaceous, bearing peltate, clathrate, appressed paleae on the under surface; veins anastomosing freely and irregularly with included veinlets; sori uniseriate on either side of the midrib, polypodioid, typically round, elliptic, or suborbicular, rarely confluent, protected at least in young stages by peltate paraphyses with flat, expanded heads; spores bilateral, nonperisporiate, smooth or nearly so.

The only Asiatic species are *P. macrocarpa* (Bory ex Willd.) Kaulf. and *P. macrosphaera* (Baker) Panigr. & Patn., both of which are recorded from India. Specimens of these have commonly been placed in *Polypodium* or lately in *Lepisorus*.

KEY TO THE SPECIES OF PLEOPELTIS

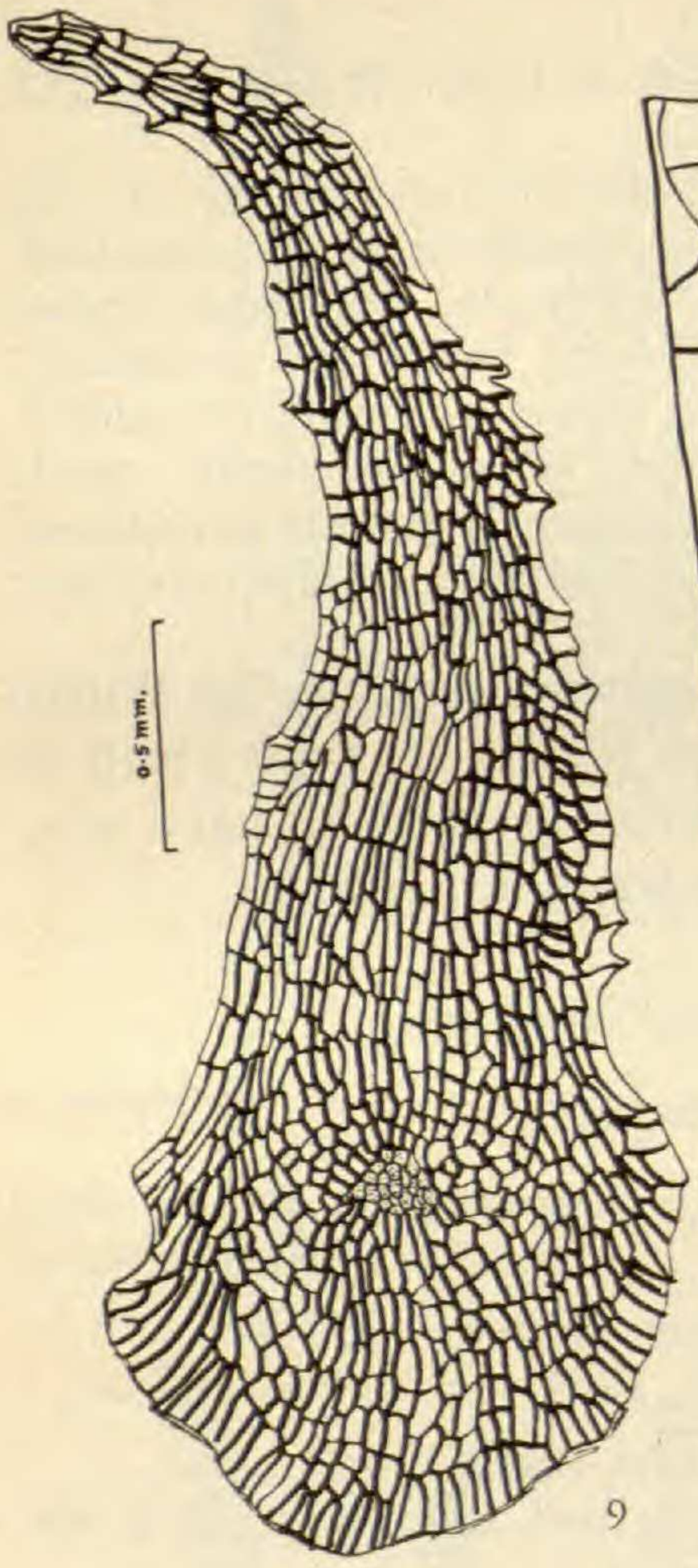
Sori submarginal or nearly so ..... 1. *P. macrosphaera*
Sori medial or near the midrib.
Laminae 1.5–3 cm broad ..... 1a. *P. macrosphaera* var. *asterolepis*
Laminae 1.5 cm broad or less ..... 2. *P. macrocarpa*

1. PLEOPELTIS MACROSPHAERA (Baker) Panigr. & Patn. Proc. Nat. Acad. Sci. India, B, **34**: 481. 1964 var. MACROSPHAERA.

Polypodium macrosphaerum Baker, Kew Bull. **1895**: 55. 1895.
Polypodium intramarginale Baker in Christ, Bull. Herb. Boiss., II, **3**: 509. 1903.
Lepisorus macrosphaerus (Baker) Ching, Bull. Fan Mem. Inst. Biol. **4**: 73. 1933.

Rhizome rather thick, creeping, epigaeous, naked except at the growing tip and stipe bases, these sparsely scaly; scales brown, thin, concolorous, ovate, obtuse, dorsally affixed, deciduous, nearly entire, the cell lumina medium-sized, uniform, clear; fronds rather distant, 30–50 cm long, up to 3 cm broad, linear-lanceolate; stipes long, terete, naked; laminae glabrous or more often scaly beneath when young, coriaceous, greenish; venation prominent; sori large, oblong, submarginal or sometimes medial.

DISTRIBUTION: Eastern Himalayas (Khasya, *C. B. Clarke 43627A*) and China, according to Ching (1934, text accompanying *pl. 62*). Also known from a recent collection at Subansiri, Forest Division, North East Frontier Agency, *Panigrahi 19858* (ASSAM).



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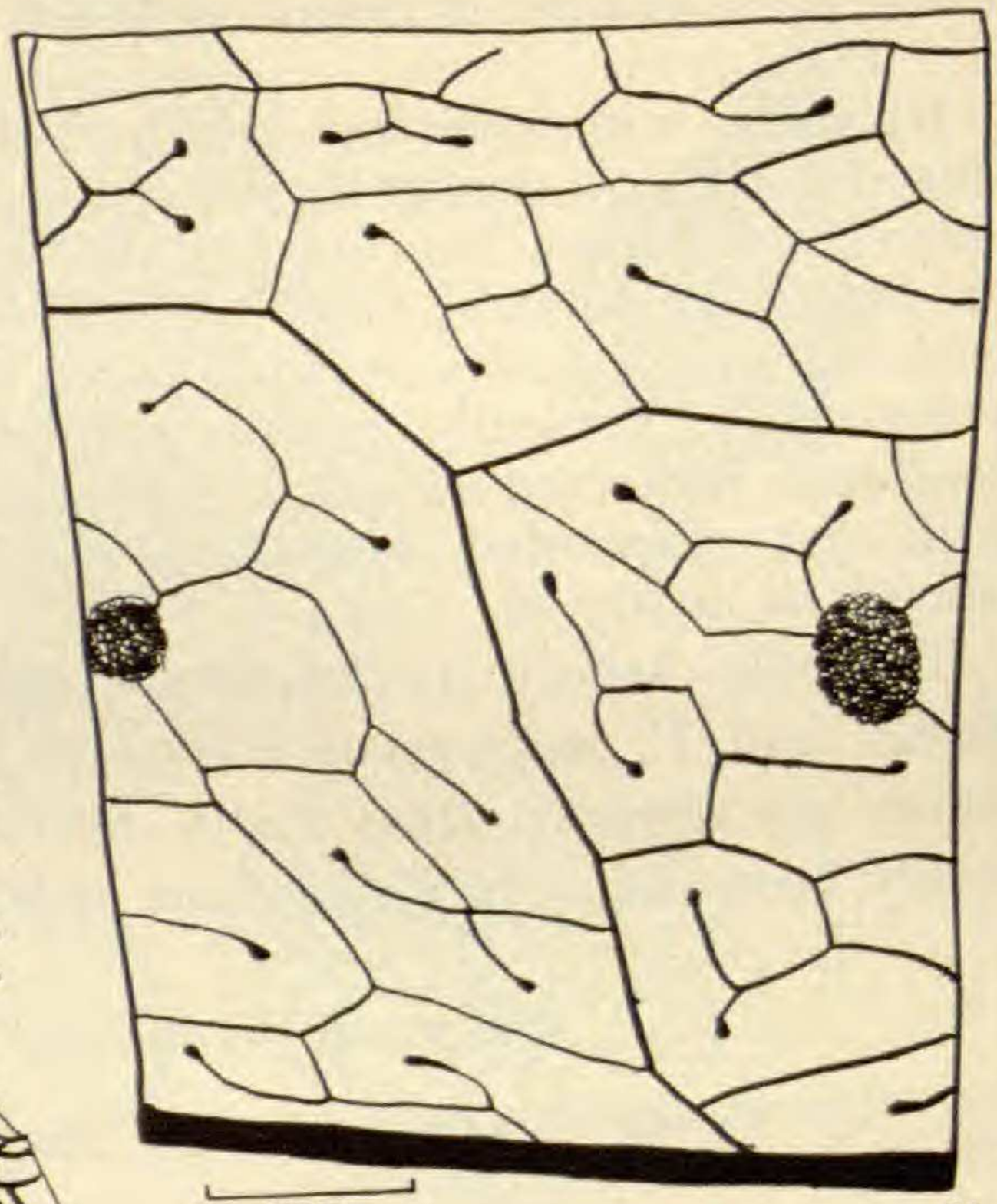

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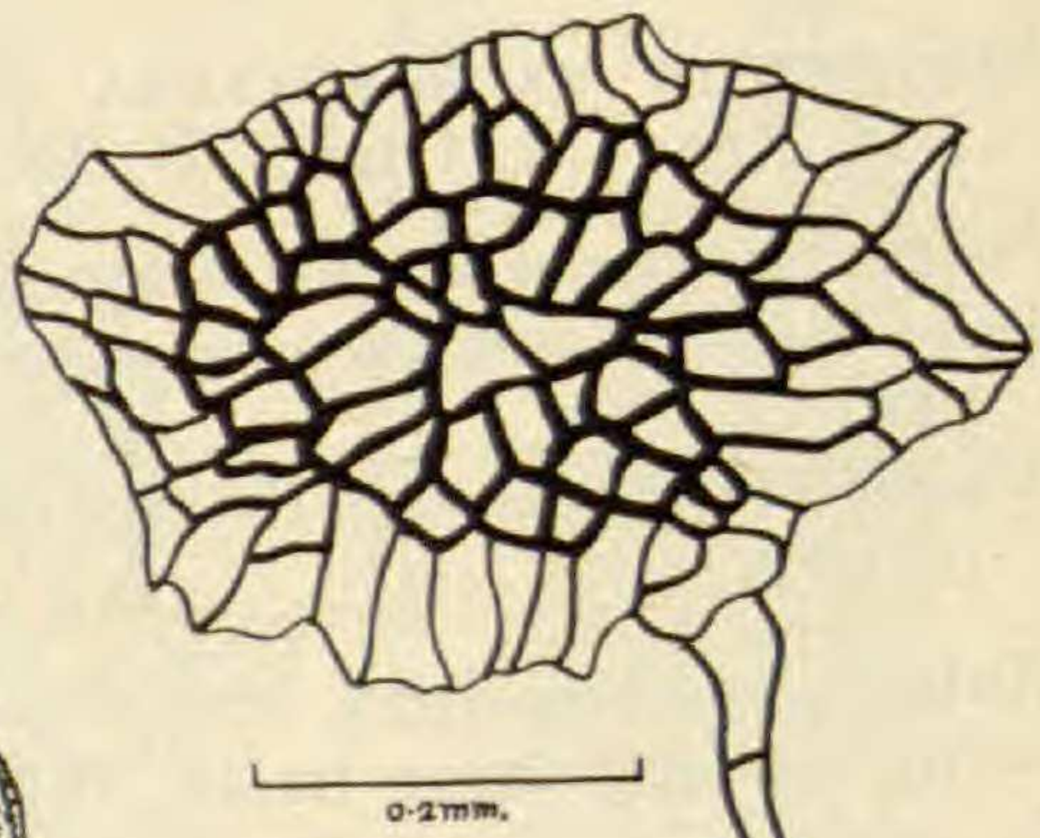

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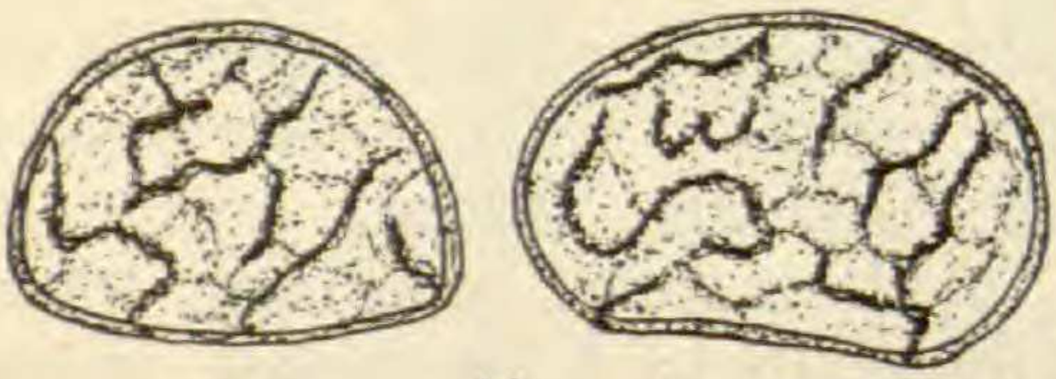

Figs. 9–12. Pleopeltis macrocarpa. Fig. 9. Rhizome scale. Fig. 10. Sporangial paraphysis. Fig. 11. Venation. Fig. 12. Spore.

The chief characteristics of this fern are the concolorous ovate-obtuse, entire scales, the submarginal sori, and the long, naked, terete stipes. In sorus position it is easily confused with *Lepisorus loriformis* (Wall. ex Mett.) Ching, which can be distinguished by the lack of scales on the under surface of the lamina.

1a. PLEOPELTIS MACROSPHAERA var. ASTEROLEPIS (Baker) Panigr. & Patn., Proc. Nat. Acad. Sci. India, B, **34**: 482. 1964. *Figs. 1–5*

Polypodium asterolepis Baker, J. Bot. Brit. & For. **26**: 230. 1888.

Fronds lanceolate-acuminate, 24–30 cm long, 1.5–3 cm broad, sparsely scaly all over beneath, more coriaceous than var. *macrosphaera*, often yellowish; venation completely immersed; sori oblong, oblique, medial; spores bright brown, reniform or plano-convex to concavo-convex, the exine slightly thick and granulated, 48–64 μ × 38–45 μ.

DISTRIBUTION: Eastern Himalayas (Assam and Manipur State), Burma, and China.

This fern is closely similar to *Lepisorus excavatus* (Bory) Ching in frond outline, but is distinguished by hidden venation and a scaly under surface. From var. *macrosphaera* it is distinguished by its broad fronds with medial sori.

SPECIMENS EXAMINED: **Eastern Himalayas:** Assam, Manipur State, Kangpokpi, Feb. 1940, *Fleming* (US). **Burma:** Taunggyi, Shan States, April 1938, *Dickason 9244* (US); Haka, Chin Hills, alt. 1890 m, April 1938, *Dickason 7418* (US).

2. PLEOPELTIS MACROCARPA (Bory ex Willd.) Kaulf.,[2] Berlin. Jahrb. Pharm. **21**: 41. 1820. *Figs. 6–12*

Polypodium lanceolatum L., Sp. Pl. **2**: 1082. 1753.

Polypodium macrocarpum Bory ex Willd. in L., Sp. Pl. ed. 4, **5**: 147. 1810.

Polypodium marginale Bory ex Willd. in L., Sp. Pl., ed. 4, **5**: 149. 1810, *non* L. 1753, *nec* Thunb. 1784.

Pleopeltis marginalis (Bory ex Willd.) Kaulf., Berlin. Jahrb. Pharm. **21**: 41. 1820, *non* Kaulf. 1824.

Pleopeltis lanceolata Kaulf. Enum. Fil. 245. 1824.

Pleopeltis linearis Kaulf., Enum. Fil. 245. 1824.

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[2] Christensen (1905–06, p. 500) and Sledge (1960) gave this reference as *P. macrocarpa* (Willd.) Kaulf. Enum. Fil. 245. 1824, which is wrong according to Pichi-Sermolli (1965). This binomial was validly published for the first time in the "Berlinisches Jahrbuch für die Pharmacie," vol. 21, in 1820. For the nomenclature and complete synonymy see Pichi-Sermolli.

Polypodium lepidotum Willd. ex Schlecht. Adumbr. Pl. **2:** 17, *t.* 7. 1825.
Pleopeltis lepidota (Willd. ex Schlecht.) Presl, Tent. Pterid. 193. 1836.
Pleopeltis lanceolata (L.) Presl, Tent. Pterid. 193. 1836, *non* Kaulf. 1824.

Rhizome widely creeping, branched, paleaceous; scales lanceolate-ovate, ferruginous, mostly dark brown in the center and pale at the margins, 2–3 mm long, 0.5–1 mm wide, appressed, ciliate-denticulate; stipes remote, 2–6 cm long, sparsely scaly; laminae 5–15 cm long, 0.5–1.5 cm wide, linear-lanceolate, the apex more or less acuminate, gradually attenuate at the base, yellowish brown, coriaceous, densely scaly on the under surface, the scales orbicular-lanceolate, dark brown, clathrate, appressed, dentate, sparsely scaly on the upper surface, the scales hyaline at the margin; veins immersed, the primary veins anastomosing to form large, oblique, elongate areolae, these with different-sized secondary areolae with a few, free, simple or rarely forked veinlets; sori large, brown, globose, oval, elliptic, or suborbicular, covered prominently in young stages with umbrella-shaped, clathrate paraphyses; annular cells 11–15; spores yellowish, plano-convex to concavo-convex or reniform, the exospore smooth and slightly thickened, 58–74 μ × 38–48 μ.

DISTRIBUTION: South India (in the Nilgiris, Palni, and Shivoroy Hills at 1500–2400 m altitude), Darjeeling, Assam (according to Beddome), Ceylon, Africa, Hawaiian Islands, St. Helena, and the American tropics.

This fern can conveniently be separated from some *Lepisorus* species which it closely resembles, namely, *L. excavatus* (Bory) Ching and *L. nudus* (Hook.) Ching, by both surfaces being paleaceous, the underside rather densely so. This polymorphic species has great variation in frond size and in sorus outline and size. The fertile fronds are often contracted.

SPECIMENS EXAMINED: **Eastern Himalayas:** Darjeeling, Oct. 1958, *Thakur* (CAL). **South India:** Kodaikanal: Shola below Moir point, alt. 2100 m, June 1962, *Bir* (PAN 4713–15)[3]; Nilgiris, alt. 2100 m, May 1886, *Gamble 17328* (US); Balmadies Estate Yercaud, alt. 1666 m, Dec. 1958, *Subramanyan 7553* (MH); Shivoroy Hills, *Perrottet 297* (CAL); Dodabelha, alt. 2400 m, June 1883, *Gamble* (CAL); Aug. 1878, *King* (CAL); Ootacomand, alt. 2250 m, June 1883, *Levinge* (CAL); Ralliah Dam, alt. 2100–2400 m, May 1954, *Sal-*

[3] The Panjab University Herbarium, Chandigarh, which is not yet included in "Index Herbariorum," is here designated PAN.

danha 1202..A (BLAT); Pulney [Palni] Hills, alt. 1260 m, Dec. 1913, *Saulière 422* (US), "Southern Hindustan," *Noyes* (US).

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